

Amendments to the Drawings:

The drawing sheets filed with this communication replace previously filed figures 1(a)-(c), 2(a)-(f), 3(a)-(f) and 4. The replacement drawings provide a higher quality versions of figures 1(a)-(c), 2(a)-(f), 3(a)-(f) and 4. In addition, the replacement drawings (1) have each figure labeled separately and (2) do not include the inventor's name.

REMARKS

The Applicants respectfully request reconsideration and allowance. The Applicants appreciate the Examiner's work to date including searching the art and reviewing the IDSes.

Claims 1-75 are pending; claims 76-102 are withdrawn.

The pending independent claims are claims 1, 14, 24, 31, 40, 49, 57, 65 and 70.

I. SPECIFICATION & DRAWINGS AMENDMENTS

The Applicants have revised the drawings and grant information. No new matter has been added.

II. RESPONSE TO REJECTIONS UNDER 35 U.S.C § 103(a)

The Examiner issued multiple obviousness rejections based on three primary references:

- 1) Miller (US Patent No. 6,270,946);
- 2) Henderson *et. al.*, (US Patent No. 6,573,369), and
- 3) Jaschke *et. al.*, Langmuir 1995, 11, 1061-1064.

In addition, the Examiner also cited as secondary references, Nakata *et. al.* (US Patent No. 5,246,609), taken alone or in combination with Nanao (US Patent No. 4,668,299).

The applicants respectfully traverse all rejections.

CLAIMS 1-3, 6-8

Independent claim 1 addresses problems facing the inventors with respect to magnetic materials nanotechnology and use of nanoscopic tips to form nanostructures useful for magnetic applications. See pages 1 and 2 of specification describing difficulties in fabricating and patterning at high resolution for magnetic applications. In claim 1, the claim speaks for itself, but the precursors are deposited on a substrate with use of nanoscopic tips and converted to magnetic nanostructures.

The Applicants agree with the Examiner that none of the primary and none of the secondary references anticipate claim 1. However, with all due respect, the Examiner underplays the substantial differences between these references and the claimed subject

matter. The primary references have nothing to teach or suggest about magnetic nanostructures or the precursor approach, and the secondary references have nothing to do with nanoscopic tips and patterning. The Applicants respectfully submit that such difference are not trivial, demonstrate the patentability of the present claims, and are not consistent with a finding of *prima facie* obviousness.

The key issues are whether the record provides motivation to combine or modify the references and also a reasonable expectation of success. The Examiner states very briefly in attempting to provide the legally required motivation to combine the primary and secondary references:

...Nakata et al. teaches the fineness required for deposited materials (col. 1, lines 52-68).

The applicants respectfully submit, however, that motivation to combine and expectation of success are not present on this record and brief statement. For example, the reasons NOT to combine these references must also be considered, along with the problem facing the inventors and reasons to not expect success. The applicants respectfully submit that the motivation suggested in the office action reflects mere impermissible hindsight.

First, the primary references indeed describe tips and nanoscopic tips but do not suggest that use of nanoscopic tips for a deposition of ink in lithography is widely applicable for use with a variety of inks including magnetic nanostructure fabrication and patterning.

For example, Jaschke was not able to control the deposition process and reported random growth processes (e.g., page 1061, right column, first full paragraph; Figure 3). Jaschke also described that deposition only occurred on mica but not on glass or gold (page 1062, right column third full paragraph). Figure 6 on page 1064 describes that solvent effects provide undesired ring shaped structures. In a nutshell, Jaschke did not describe a well-controlled process which can solve commercial problems.

In addition, Miller is a “paper patent” which does not provide an enabling disclosure and does not demonstrate with any working examples that use of nanoscopic tips is widely applicable. For example, Miller describes the nature of the technology by stating that AFM-based methods are “limited to the chemicals used and the mechanics of the probes themselves” (col. 1, lines 40-41). Miller merely describes building up layers based on

difunctional molecules (e.g., see Figure 1, six steps) but never describes a specific molecule which could be useful to solve a problem.

Finally, Henderson is also a “paper patent” which does not provide an enabling disclosure and does not demonstrate with any working examples that use of nanoscopic tips is easy or widely applicable. Also, Henderson focuses on biological molecule depositions such as protein.

All of this cuts against an expectation of success. The primary references are substantially different from what the applicant claims and the problem facing the inventors. In a nutshell, none of the primary references relate to magnetic material problems in the art. Still further, none of the primary references refer to a precursor approach to solving problems. Therefore, a review of the record clearly shows that one of ordinary skill in the art faced with a problem related to magnetic nanostructures would not turn to any of the references, be it Jaschke, Miller, or Henderson. The differences between claim 1 and the primary references are not small, insubstantial differences. The primary references, in short, suggest nothing that directs one of ordinary skill in the art to select magnetic precursors and magnetic materials.

Equally important, the secondary reference, Nakata, does not describe anything about use of nanoscopic tips for deposition on a substrate. Nakata merely describes formation of fine particles but in no way describes or suggests anything other than conventional processing of these particles. Nakata is silent on use of tips, let alone nanoscopic tips. Hence, one skilled in the art faced with a problem of forming nanostructures on substrates would not turn Nakata as it merely describes making particles and subsequent conventional processing.

Moreover, none of the references teach or suggest any equivalency between the deposited materials in the primary and secondary references. For example, the biological materials of Henderson are not equivalent to non-biological magnetic precursor materials in Nakata. Also, the non-metallic thiol materials of Jaschke are not equivalent to Nakata magnetic precursor materials. Finally, the unnamed difunctional materials of Miller are not equivalent to Nakata magnetic precursor materials.

Even further, incorporation of magnetic materials of Nakata would destroy the teachings of the primary references. One cannot make bioarrays with magnetic materials per Henderson; one cannot build up layers of difunctional materials with magnetic materials per

Miller; and one cannot scan alkane thiol molecules with magnetic materials per Jaschke. Again, no *prima facie* obviousness is present in this record.

While the above remarks focus on claim 1, other claims are also rejected but should be considered independently for patentability.

Finally, the Applicants stress that they have actual working examples demonstrating the claimed subject matter (specification, pages 20-25). The Applicants invite the Examiner to review the working examples to better appreciate the claimed subject matter which the prior art did not provide.

In sum, only impermissible hindsight permits these combinations.

CLAIMS 4-5, 9-75

For these claims, the Examiner adds Nanao to the combination to fabricate an argument against patentability. However, Nanao does not cure the problems with the *prima facie* obviousness argument cited in the office action and discussed above. Again, no motivation to combine references is present. No expectation of success is present. Again, the Applicants traverse this rejection.

Nanao is cumulative to Nakata and does not address the more fundamental issues of motivation to combine noted above. Nanao again teaches formulation with conventional processing. Nakata and Nanao each say nothing about deposition of materials from tips. Again, each reference would destroy the teachings of the primary references if combined. Neither reference suggests any equivalency between, for example, biological materials (Henderson) and magnetic materials. Or equivalency between unnamed difunctional molecules (Miller) and magnetic materials.

Again, the Applicants encourage the Examiner to review each claim individually on the merits.

In sum, the Examiner must consider the full teachings of these references and not “pick and choose” to construct the claims with hindsight.

III. RESPONSE TO DOUBLE PATENTING REJECTIONS

The PTO issued two non-statutory obviousness-type double patenting rejections citing each of Applicants' US Patent Nos. 6,635,311 and 6,827,979 as a primary reference and Nakata *et. al.* (US Patent No. 5,246,609) as a secondary reference. The applicants respectfully traverse.

Obviousness type double patenting requires a comparison of the pending claim with a claim in the cited reference. The Examiner has not shown that he has done this fundamental step in the Office Action. For example, claim 1 in 6,635,311 recites use of gold surface, AFM tips, and sulfur compounds. The claim does not recite magnetic nanostructures. That is a large difference and it is not evident in the record the Examiner has appreciated this difference. Similarly, the claims in 6,827,979 do not recite magnetic nanostructures. Hence, differences between the pending claims and the cited claim appear to be large and substantial. Therefore, double patenting would appear to be a non-issue as the scope of the claims which must be compared are not even remotely close. If the Examiner would maintain this rejection, a detailed explanation based on comparison of claims should be provided.

IV. CONCLUSION

The Applicants believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested. The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or any other provision, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741. No extension of time is believed needed.

Respectfully submitted,

Date

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